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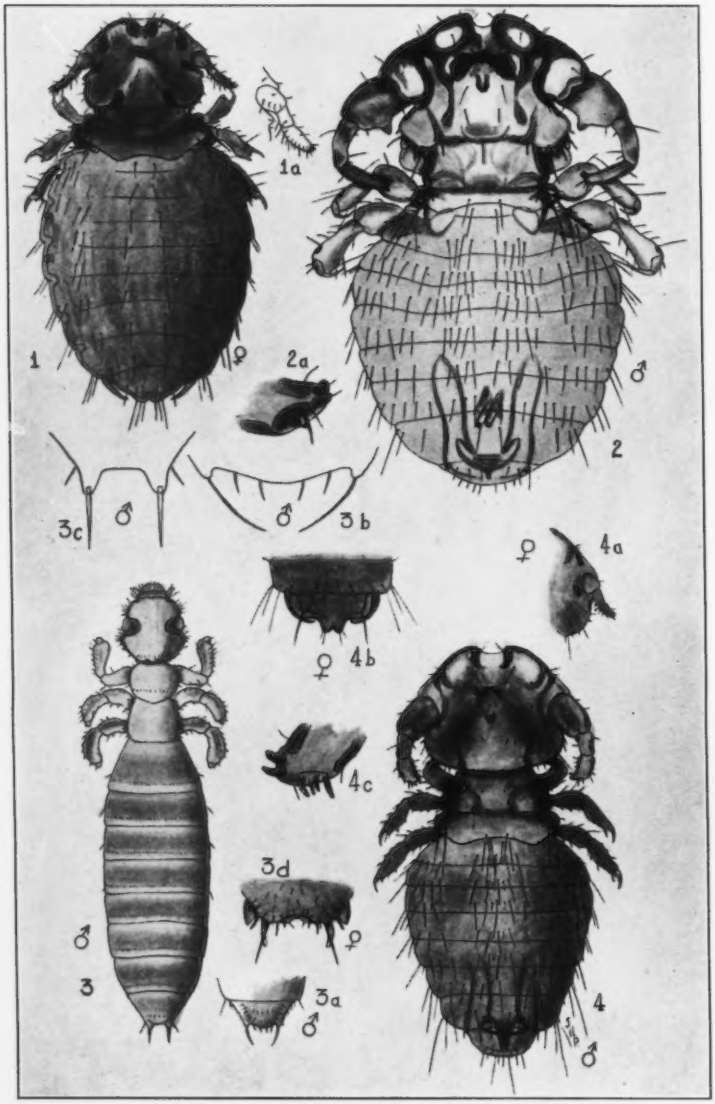

MALLOPHAGA FROM MAMMALS—PAINE.

J. H. PAINE, DEL.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXIII. DECEMBER, 1912. NO. 10.

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Notes on a Miscellaneous Collection of Mallophaga from Mammals.

By JOHN HOWARD PAINE, Stanford University, California.

(With Plate XX.)

Trichodectes mephitidis Osborn.

Numerous specimens from *Mephitis mephitica* (Stanford University), *Mephitis machura* (Fairbanks, Arizona), and a skunk (Choro, Bolivia). This species is very closely allied to *T. castoris* Osborn, of which it may be merely a variety, a difference in host being a rather slight specific character.

Trichodectes geomydis Osborn.

Specimens from *Thomomys bottae, T. bulvivarus* (Monterey, Cal.) and a ground squirrel (Santa Rosa, Cal.).

Trichodectes setosus Giebel.

Several individuals of this large species from the western porcupine, *Erethizon epixanthus* (Tuolumne, Cal.).

Trichodectes parallelus Osborn.

Four specimens from the red deer (Michigan Agricultural College).

Trichodectes subrostratus Nitzsch.

Numerous specimens from a domestic cat (Stanford University), also collected in large numbers from a lynx, *Lynx rufus* (San Gregorio, Cal.). It is not known whether the species generally infests the lynx or not, but probably this is a case of "straggling."

Trichodectes forficula Piaget.

Four specimens from a wild dog, *Cyon dukkhensis* (Dhikala, Ghurwal District, at the base of the West Himalayas, India). This species is described by Piaget from a deer, *Cervus porcinus,* from the Zoological Gardens of Rotterdam. This case is not so easily explained by "straggling."

Trichodectes climax Nitzsch.

Collected in large numbers from an Angora goat (Palo Alto, Cal.).

Trichodectes scalaris Nitzsch.

Found in large numbers on calves.

Trichodectes parumpilosus Piaget.

Abundant on the horse.

Trichodectes octomaculatus n. sp. (Pl. XX, Fig. 1.).

A large number of specimens, apparently all female, from the western raccoon, *Procyon psora* (Stanford University), This form is easily recognizable by the eight distinct chestnut blotches on the head, these being the only dark markings on the insect.

Description of female: Head broader than long with front broadly rounded though slightly flattened on the sides, with a clear space in the middle not excised; the antennal bands turn inward just as they reach the central clear portion and end in a chestnut colored blotch; there is a similar blotch on the margin well in front of the small trabecular projections. There are several minute hairs on the frontal margin, two on each side of the central clear portion, one between the two blotches and another near the posterior frontal blotch; also a still smaller one on the trabecular-like projection and four on the dorsal surface, two of which occur close together just behind the central clear portion while the others arise, one on each side, near the margin close behind the posterior blotch. Temples

rounded, eye prominent with an ocular blotch similar to those in front, only smaller; a minute hair on the eye with another close behind it and five more occurring on the temples, being placed quite regularly around to the prominent occipital blotches; one rather long heavy hair on the temple arising at the point where it meets the prothorax; occiput slightly sinuous, without marginal hairs. Antennae quite long, the terminal segment longest. (Fig. 1a). General color of head and thorax pale yellowish brown.

Prothorax short, slightly darker than head with divergent sides and posterior margin convex; a minute hair on each lateral margin and two longer ones on the posterior margin, one on each side of the meson. Metathorax also short but considerably wider than prothorax; a rather prominent hair on the acute anterior angle and two similar ones behind, on the surface; sides strongly convergent, with obtuse posterior angles; posterior margin concave, without hairs. Legs short, rather heavy with prominent claw and numerous hairs.

Abdomen elliptical, slightly narrowed posteriorly; color pale to transparent. Two hairs near the meson on each segment and two others on each side midway between the meson and lateral margin; several hairs in each posterior lateral angle. Margin thickened with a continuous transparent band, enlarged at the sutures. Last segment notched, with three hairs on each angle. Prominent spiracles on the lateral margins of segments 2, 3 and 4.

		Length	Width
Measurements:	Female	1.32	
	Head	.30	.42
	Thorax	.16	.44
	Abdomen	.86	.72

Trichodectes minutus n. sp. (Pl. XX, Fig. 4).

Three specimens, one male and two females, from a weasel (*Putoris noveboracensis*) were collected by H. E. Ewing (Marshall, Ill.). This species resembles Nitzsch's *T. retusus* from *Mustela vulgaris* and *M. erminea*, but, unlike that species, there is a striking difference in the antennae of the two sexes. Osborn has recorded *T. retusus* from a weasel (Ames, Iowa).

Description of Male: Color pale yellow. Head sub-pentagonal, front angular, rather deeply incised with a clear space behind the incision; prominent, trabeculae-like processes in front of the antennae; antennal bands prominent, extending to the frontal incision where they turn back, forming an acute angle. Antennae large, reaching posteriorly beyond the head; first segment large and nearly as long as the following two, of which the last is a little longer; several short thick spines on the tip of the distal segment (Fig. 4c). Temples prominent, broadly, not angularly rounded as in *T. retusus*, with

several short hairs and one rather long one; occiput convex, slightly emarginate on each side where the occipital bands meet the margin. Head widest across the trabeculae-like processes.

Thorax long; prothorax trapezoidal, with diverging sides and straight posterior margin; a hair in each posterior angle and two on the posterior margin. Metathorax shorter and broader than prothorax with anterior angles broadly rounded, sides converging and posterior margin concave; a short hair on the lateral margin and two longer ones on each side on the dorsal surface; also two near the meson. Legs poorly developed.

Abdomen subovate, widest at the second and third segments and regularly diminishing to the seventh; last segment protruding with two rather long hairs and several shorter ones; also a row of prominent hairs across each of the other segments, those in the mesal region being more closely set. Color pale yellow.

Female. Antennae short (Fig. 4a), ordinary, with segments of nearly equal length. Trabeculae-like processes longer and more acute than in the male. Abdomen more developed, subquadrilateral; widest at second segment and diminishing slightly to the sixth, with seventh segment narrowed and the last narrow, bilobed; two chitinized hook-like processes apparently arising from the sixth segment (Fig. 4b).

Measurements: ♀ .96; ♂ .80.

	Length		Width	
	Male	Female	Male	Female
Head	.24	.26	.28	.32
Thorax	.14	.16	.24	.28
Abdomen	.42	.54	.36	.40

Trichodectes californicus Chapman. (Pl. XX, Fig. 2).

With some hesitation I refer several specimens, male and female, from *Dipodomys merriami*, a pocket rat (Arizona), to this species. The females of the specimens in hand are very similar to *T. californicus*, but have fewer hairs on the thorax and abdomen, less than half as many in the case of the metathorax. The male, which has heretofore been unknown, differs greatly from the female in the shape of the head and in the antennae. The temples are nearly square, with two short broad spines on the posterior angle. The antennae are very striking, being long enough to reach well back on to the abdomen; first joint large, deep set, a little longer than either of the succeeding joints, with a prominent tooth-like appendage midway on the inner side; second and third joints long and narrow and about equal in length; two short heavy teeth and several longer spines on the tip of the last segment (Fig. 2a).

Gyropus ovalis Nitzsch.

Specimens of this species and of the following from the guinea pig, *Cavia cobaya*, sent in by H. E. Ewing (Urbana, Ill.). (Also from Cambridge, Mass., by S. S. Berry.)

Gyropus gracilis Nitzsch.

Many specimens (Urbana, Ill.; Cambridge, Mass.).

Gyropus bicaudatus n. sp. (Pl. XX, Fig. 3).

A large series of specimens taken by W. M. Mann from a wild guinea pig (*Cavia cutleri*), collected by Dr. W. E. Castle in Peru. This species closely resembles in general habit Nitzsch's *G. gracilis*, but is strikingly different in the form of the last abdominal segment in the male. In the present species this segment narrows and gives rise to two prominent appendages, each bearing a strong spine, giving the insect a very characteristic appearance. This difference is shown in Figs. 3b and 3c, the former being drawn from specimens of *G. gracilis* Nitzsch.

Description of male: Entire insect pale, often white or transparent. Head closely resembling that of *G. gracilis*, Nitzsch. Antennal, ocular and temporal bands faint, continuous, marginal, enlarged slightly around the lateral emarginations; numerous minute hairs on the margin of the rounded clypeus and a row across on the surface near the margin; also several hairs on the divergent sides before the lateral emarginations and on the convergent temples. Thorax narrower than head, prothorax almost circular, with posterior margin slightly angled on the meson; metathorax quadrilateral, sides slightly rounded. Abdomen long and narrow with sides, between the second and sixth segments, almost straight; last two or three segments tapering, the last being produced into two appendages (Figs. 3 and 3c), each appendage bearing a stout spine; a short fine hair on the lateral margin of this segment just above the appendage. In old specimens a faint transverse band is visible across each segment; a row of extremely minute spines or prickles across each segment.

Measurements: ♂ 1.16; ♀ 1.22.

	Length		Width	
	Male	Female	Male	Female
Head	.18	.18	.16	.18
Prothorax	.10	.10	.12	.14
Metathorax	.12	.12	.12	.14
Abdomen	.76	.82	.28	.36

Menopon jenningsi Kellogg & Paine.

A female specimen collected by W. M. Mann from a wild guinea pig (*Cavia cutleri*), brought from Peru by Dr. W. E. Castle. This is the second record of this peculiar species and is of special interest, coming as it does from a wild form of *Cavia*, thus more certainly establishing the guinea pig as its typical host. The type is from the tame *C. cobaya*.

EXPLANATION OF PLATE XX.

Fig. 1. *Trichodectes octomaculatus* Paine, n. sp. ♀.
Fig. 1a. *Trichodectes octomaculatus* Paine, antenna of ♀. (Enlarged).
Fig. 2. *Trichodectes californicus* Chapman ♂.
Fig. 2a. *Trichodectes californicus* Chapman, tip of last segment of antenna of ♂.
Fig. 3. *Gyropus bicaudatus* Paine, n. sp. ♂.
Fig. 3a. *Gyropus gracilis* Nitzsch, last segment of ♂.
Fig. 3b. *Gyropus gracilis* Nitzsch, last segment of ♂ (enlarged).
Fig. 3c. *Gyropus bicaudatus* Paine, last segment of ♂ (enlarged).
Fig. 3d. *Gyropus bicaudatus* Paine, last segment of ♀.
Fig. 4. *Trichodectes minutus* Paine, n. sp. ♂.
Fig. 4a. *Trichodectes minutus* Paine, antenna of ♀.
Fig. 4b. *Trichodectes minutus* Paine, last segment of ♀.
Fig. 4c. *Trichodectes minutus* Paine, tip of last segment of antenna of ♂.

Eupithecias that appear to be undescribed (Lepid.).

By RICHARD F. PEARSALL, Brooklyn, New York.

(Continued)

The following species I fear I have distributed to some of my friends, under the name of *multiscripta*, Hulst. I had at that time, a single specimen of the latter from Colorado, verified by comparison with the type, but I thought these were possibly but a variation of it. Later, when more material came to me from both localities, I found that we had in the Southwest another large species, very like unto *multiscripta*, in size, shape and color, which I have called

Eupithecia perillata, n. sp.

Expanse 28-30 mm. Palpi long, stout, gray, tipped with white. Front gray, bordered narrowly along orbits, and over clypeus with white. Antennae rather stout and ciliate in both sexes, gray, barred finely with black.

All wings above, gray, faintly tinged with brownish, and frosted with white scales, quite evenly distributed over the central portions between extra basal and extra discal lines, and in broken patches along costa of primaries, most conspicuous just beyond the inception of the extra and intradiscal lines. A number of black hair lines, wavy and much broken cross the wings. On costa of primaries these enlarge into spots and mark the beginning of four of the most conspicuous lines. The basal only one sixth out crosses costa, then turns rapidly inward to base of wing. Two or three similar parallel lines form the extra basal, starting one-third out from costa, after crossing which, they turn sharply inward much waved and partly obliterated centrally, but clear at inner margin. The intradiscal, a single clear black line, crosses costa above discal mark, makes a sharp outward angle enclosing it, and turning inward parallel to extra basal lines, touches inner margin at centre. The extra discal with its accompanying geminate pale line, after crossing costa, angles sharply outward and parallels the intra discal to inner margin, waved or scalloped between the veins. The subterminal line, not clear white, but broad and much waved to anal angle, outwardly borders a greasy brownish shade line. On all wings are fine, marginal black lines, broken at veins, with the fringes of ground color, long and spotted with dusky opposite veins. Discal spots on primaries oval, or linear, partly encircled with white scales, on secondaries small almost invisible dusky dots.

Secondaries with fine black cross lines evident at inner margin, but not reaching across wing; the intra and extra discal with its geminate pale line, being clearly defined.

Body of ground color, the second segment white, its posterior border narrowly edged with black, third segment brownish anteriorly, marked laterally with a large black spot; smaller lateral spots appear on two or three succeeding segments.

Beneath, the primaries are dusky, with cross lines broad and not so definite, and the costa from base to extra discal, and lower terminal space are powdered with white scales. Discal dots jet black, crescentic. Secondaries evenly powdered with white scales, thus throwing into relief the black cross lines, especially in the ♂ type, where they are continuous and enlarged at vein crossings. Discal dots evident, black. Marginal lines and fringes as above.

Types: A male and female from San Diego, Calif., the former taken April 3, 1910, the latter March 31, 1910 (Ricksecker), and twelve co-types of both sexes from the same locality, are in the author's collection.

(To be continued)

New Records of Bees (Hymen.).

By T. D. A. COCKERELL, Boulder, Colorado.

Xylocopa orpifex Smith.

Knight's Valley, California. British Museum (506—84, 73.)

Xylocopa arizonensis Cresson.

Lake County, California; both sexes (O. T. Baron). Brit. Museum.

Alcidamea simplex (Cresson).

Trenton Falls, New York (E. Doubleday); from F. Smith's collection; two males, Brit. Museum.

Hypanthidium aureocinctum sp. n.

♀ Length a little over 7 mm., moderately robust; head and thorax densely punctured, black, marked with yellow; clypeus, mandibles (except apical margin), malar space, cheeks, a broad band across hind part of vertex (continuous with yellow of cheeks), broad bands at sides of face (extending to top of eyes), and a large U-shaped mark between antennæ, all chrome yellow; region between antennæ somewhat elevated; black of front extending downward to top of clypeus as a narrow band on each side; scape and base of flagellum light orange-ferruginous; rest of flagellum also ferruginous, but more dusky; occiput black; prothorax black, but tubercles tipped with yellow; pleura mainly yellow; mesothorax with a narrow yellow (reddish-tinted) margin on each side and in front, except about the middle fifth in front, where the bands are connected with narrow stripes extending backward over the mesothorax; scutellum projecting, emarginate in middle, the apical margin, with the axillæ, broadly chrome yellow; metathorax black, dull, the base with a series of pits; hair of head and thorax pale yellowish, scanty; tegulæ dull orange, ferruginous in middle; wings dusky, strongly so in costal region; second r. n. going well beyond second s. m.; legs yellow, the femora and tibiæ marked with ferruginous; no pulvilli; abdomen strongly punctured, the punctures large on the basal half of the segments, small and dense on the apical part; the segments black at base, broadly ferruginous at apex, each with a very broad entire chrome yellow band, which is not notched sub-laterally or in the middle; on the first segment the band bends sharply at its ends, sending a short process along the sides; the fifth and sixth segments appear all yellow, except that the fifth is obscurely ferruginous apically, and the sixth has a subapical dark interrupted band; ventral scopa yellowish-white.

Hab.—Mexico (F. Smith's collection, 79-22). Brit. Museum. This is the first *Hypanthidium* north of Panama. I was at first inclined to think that it might be the undescribed male of *Anthidium bivittatum* Cresson, but I believe *bivittatum* is a *Dianthidium,* and the differences indicated on comparison with Cresson's description can hardly be all due to sex. *H. aureocinctum* is not very closely related to its South American relatives, but it is seen on comparison to be of the same general type as *H. flavomarginatum* (Smith). In Friese's table (Das Tierreich) is runs nearest to *Dianthidium apicale,* from which it differs in many details.

Panurginus cressoniellus calochorti Cockerell.

Cripple Creek, Colorado, July 27 and 31, 2 ♀, 5 ♂ (*S. A. Rohwer*). Both sexes at flowers of *Potentilla*: males also at *Pentstemon* and *Geranium.* The male does not differ from that of typical *cressoniellus.* The altitude of the locality is 9590 ft. A study of a series of New Mexico females of *cressoniellus* indicates that *calocharti* is not more than a variety, certainly not a subspecies. Specimens from Beulah, August 18 (*W. Porter*), hill above Beulah, August 19 (*W. Porter*), Harvey's Ranch, August 22 (*Porter* and *Ckll.*), and Viveash Ranch, 9000 ft., July 21 (*Ckll.*), all have dark antennæ and belong with *calochorti.* Specimens from west of Beulah, August 23 (*W. Porter*) and top of Las Vegas Range, June 29 (*Ckll.*) have the flagellum red beneath. Thus there is no evident relation between altitude and the color of the antennæ. Sometimes the first r. n. enters the basal corner of the second s. m.

Panurginus verus Cockerell.

Upon comparison of the female types, it is seen that this is very close to *P. cressoniellus calochorti.* Aside from the difference in the recurrent nervure, *P. verus* has the deeper marginal cell rounded instead of angled at its upper apical corner, and the second abdominal segment (exclusive of the apical depression) more closely and evidently punctured. The last character is a variable one in *cressoniellus.* I incline to the opinion

that *verus* is after all a variety of *cressoniellus*. This idea receives support from the fact that additional specimens of *P. verus* show much variation, while the males do not appear to differ from those of *P. cressoniellus* except in venation. A male *verus* from Beulah, N. M. (July 27, *Cockerell*) has the wings unusually reddish. Both sexes (one pair united) were taken by Mr. S. A. Rohwer at Topaz Butte, Colorado, at flowers of *Drymocallis fissa*, June 23 and 30, 1907. All things considered, I believe we ought to write *P. cressoniellus verus*.

Panurginus bakeri (Cockerell).

Rio Ruidoso, White Mountains, New Mexico, prox. 6500 ft., August 4 (*Townsend*).

Panurginus neomexicanus Cockerell.

Beulah, New Mexico, August 18, ♂ (*W. Porter*); Rio Ruidoso, N. M., prox. 7600 ft., at flowers of *Solidago trinervata*, August, ♂ (*Townsend*).

Panurginus boylei (Cockerell).

Las Vegas, New Mexico, males at flowers of *Meliotus alba* and *Sphaeralcea lobata*, August 9 (*W. Porter*).

Panurginus pauper flavotinctus Cockerell.

Las Vegas, N. M., females, one at *Grindelia nuda*, August 14 (*W. Porter*). The female is easily known from *P. nigrinus* Viereck by the very fine sculpture of the metathorax, with the margins of the basal enclosure shining.

Panurginus innuptus Cockerell var. **absonus** v. n.

♂. With a rather large supraclypeal spot; stigma and nervures dark reddish brown. Easily known from *P. rudbeckiae* (Rob.) by the broadly truncate lateral face marks and the thicker flagellum. Pecos, New Mexico, August (*W. P. Cockerell*). I believe that comparison of types will show that *P. innuptus* is identical with *P. picipes* (*Panurgus picipes* Cresson).

Panurginus illinoiensis (Cresson).

Males from Fedor, Texas, April 2 and 21 (*Birkmann*), which I had doubtfully labelled as a variety of *P. renimaculatus*, prove to be entirely distinct from that species, and to agree with *P. illinoisensis*, although the wings are paler and the tibiæ show more yellow than in a specimen from Vir-

ginia. The flagellar joints are broader than long, and the process of the labrum is characteristic, being extremely broad, with a practically straight edge (not emarginate as in *rudbeckiae*), its color pale yellow, with the edge dark.

Panurginus picitarsis n. n.

Panurginus picipes Morawitz, Hor. Soc. Ent. Ross., xxiv (1890) p. 358.—China. Not *P. picipes* (Cresson 1872).

Panurginus labrosiformis distractus subsp. n.

♂ Length about 5 mm.; like *P. rudbeckiae* (Rob.), differing thus: smaller; b. n. barely falling short of t. m. (falling considerably short in *rudbeckiae*); the long and slender flagellum pale yellowish-red beneath, except at base and apex; the broad-triangular process of labrum with a narrow truncate (not emarginate) apex, wholly different from the broad, emarginate process of *rudbeckiae*. As in *P. rudbeckiae*, the clypeus has a median groove. This agrees with *P. labrosiformis* Rob. in the narrowed process of labrum, and the impressed lines on the mesothorax; but the antennæ are long and slender and the wings are quite strongly dusky. The supraclypeal spot is a mere point. The second and third abdominal segments have the depressed basal part dull, while the apical part is shining, with distinct minute punctures; in this the insect resembles *P. asteris*. Another similar species is *P. bidentis* (Ckll.); this has the process of labrum strongly emarginate.

Hab.—Lincoln, Nebraska, August (*L. Bruner*, 9). Very likely a distinct species, but I describe it as a sub-species of *labrosiformis* (which I know only from description), as it seems to nearly agree in structure. In the table of Nebraska *Panurginus* in ENT. NEWS, May, 1907, p. 184, it runs to *P. renimaculatus*, which has the process of labrum deeply emarginate.

Exomalopsis zexmeniae sp. n.

Exomalopsis pulchella Cockerell, Ann. Mag. Nat. Hist., July, 1912, p. 29 (not of Cresson).

Very like *E. pulchella* Cresson, but the receipt of a series of genuine *pulchella* (from Liguanea Plain, Jamaica; *C. T. Brues*) shows that the Guatemalan species (type from Quirigua, at flowers of *Zexmenia*; *W. P. Cockerell*) is distinct by its rather larger size, black (instead of fulvous) hair of scutellum; more strongly punctured clypeus, but especially by the very large knee-plate of hind legs, that of *pulchella* being very small.

Studies Amongst the Coccinellidae, No. 4 (Col.).

By F. W. NUNENMACHER, Piedmont, California.

Agrabia sicardi n. sp.

Color, shining black except head of ♂, sides and front margin with median spur from latter extending backwards one-third the width of pronotum, the legs and epipleurae, the sides of the first, second and third ventral segments, and the entire last segment, which are rufotestaceous; and one small irregular spot placed on each elytron two-thirds the distance posteriorly and close to the suture, which is blood red. *Form,* oval, feebly convexed. *Head,* closely and very coarsely punctured. *Pronotum,* a little less closely and coarsely punctured than the head. *Elytra,* punctured like the pronotum. *Ventral surface,* coarsely and irregularly punctured, the punctures becoming coarser at sides.

Length: ♂ 5 mm.; ♀ 5.50 mm. *Width*: ♂ 4 mm.; ♀ 4.50 mm.

Type.— ♂ ♀ and one cotype in my collection.

Type locality.—Hamburg, Siskiyou Co., Calif., June 1, 1911 (Nunenmacher).

Geo. Dist.—Siskiyou Co. and Shasta Co. (Castella Cottle), Calif.

I dedicate this pretty species to my friend, Dr. A. Sicard, for his many kind favors.

Agrabia sicardi var **complexa** n. var.

Color and structure as in *sicardi* except for the elytra which have two small spots and a fascia situated as follows: one small spot at middle of base, one small discal one-third of distance from base and nearer the margin than the suture, and a transverse comma-shaped fascia at two-thirds the distance from base, with the larger and rounded end very close to the suture; and the tip of the elytra, yellow.

Type.— ♂ in my collection.

Type locality.—Hamburg, Siskiyou Co., Calif., June 2, 1911 (Nunenmacher).

Coccinella humboldtiensis n. sp.

Color—Black except for two small irregular spots on the vertex of the head close to the eyes and the anterior angles of the pronotum which are yellow, and the elytra which are a yellowish red with the exception of a large roundish black scutellar spot. *Form,* elongately oval and slightly convex. *Head,* sparsely and coarsely punctured.

Pronotum, closely and finely punctured. *Elytra*, closely and coarsely punctured. *Ventral Surface*, more sparsely punctured than elytra, but as coarsely.

Length: ♂ 4 mm.; ♀ 4.50 mm. *Width*: ♂ 3 mm.; ♀ 3.50 mm.

Type.—♂ ♀ and cotype in my collection.

Type locality.—Crescent City, Del Norte Co., Calif., May 27, 1910 (Nunenmacher).

Varieties: *A.* With a small marginal black spot at one-third from base, another discal at one-third from base, and a larger at two-thirds.

B. With two small spots arranged transversely at two-thirds the distance from base, the marginal one not touching and smaller.

C. With the two spots of *B* joined forming a fascia.

D. With two fasciae, one just before the middle and one at two-thirds the distance from base.

I have a form of *Adalia frigida* Muls. from Br. Columbia that has almost the same markings as *D.*, but in that species the spots slant backwards, whereas in Var. *D.*, they slant forwards. By the shape of the head and eyes, the more slender form, and the peculiarities of puncture, this species approaches *C. tricuspis* Kirby, but in regard to the form of the metacoxal line, it approaches *C. trifasciata* Linn. It can, however, readily be separated from the latter by its more slender and less convex form, by the coarse punctuation, and by the weaker claws. It seems to be a local species found in the swampy land of Del Norte Co., Calif.

Brachyacantha lengi n. sp.

Color: ♂ Black except head, front, anterior angles, and sides of pronotum, the side maculation not quite reaching the base; front and middle legs, knees and tibiae of hind legs, and five spots on each elytron, yellow. The five elytral spots are arranged as follows: a small humeral; a large, narrow, scutellar, not quite reaching the humeral; one more or less triangular marginal, facing the discal, just behind the middle; one discal at same distance but close to the suture; and a subapical a little larger than the others closer to the margin than to the suture or tips. *Form*, regularly oval, convex. *Head*, closely, shallowly, and finely punctured. *Pronotum*, closely and finely punctured. *Elytra*, punctured like pronotum. *Ventral Surface*, closely and much more coarsely punctured than elytra.

Length: ♂ 4 mm. *Width*: 3 mm.

Type.— ♂ in my collection.

Type locality.—Weitchpec, Humboldt Co., Calif. (on oak), May 20, 1911 (Nunenmacher).

The metacoxal line in this species curves to meet the first ventral suture, runs with it a short distance, then curves forward and stops just as it clears the suture. In Mr. Leng's table, it will fall in his fourth group and near *fenyesi*, having the fifth ventral segment strongly excavated. The spine on the anterior tibia is small, about as wide as long, appearing as an acute triangle. I dedicate this to my friend, Mr. C. W. Leng, in recognition of his able work on this group.

Hyperaspis idae n. sp.

♀ *Color,* shining black throughout except the elytra, which have three red spots arranged as follows: a semi-circular marginal about its own width from base and with its straight side touching the margin; a small rounded discal placed just before the middle and closer to the suture than to the margin; and a subapical one the same size as the discal, nearer the margin than the suture or tip. *Form,* broadly oval, feebly convex. *Head,* finely punctured. *Pronotum,* slightly more coarsely and closely punctured than the head. *Elytra,* punctured like pronotum. *Ventral Surface,* closely and coarsely punctured.

Length: ♀ 2.25 mm. *Width*: 2.50 mm.

Type.— ♀ and one cotype ♀ in my collection.

Type locality.—Humboldt Co., Calif., April 25, 1911 (Nunenmacher).

Geo. Dist.—Humboldt Co., Calif., one specimen; Guernevill, Sonoma Co., Calif., May 30, 1908, one specimen (Dr. F. E. Blaisdell).

This species is closely related to *lateralis* Muls. The form of the metacoxal line in this species leaves a space between it and the first ventral suture whereas in *lateralis* it touches the first ventral suture. The two specimens before me were taken in different places but are identical in every regard.

Hyperaspis falli n. sp.

♂ *Color,* deep shining black except the head and anterior angles of pronotum, which are yellow, and the front pair of legs, tibiae and tarsi of the others, which are dark testaceous. *Form,* broadly oval, feebly convex. *Head,* very finely and closely punctured. *Pronotum,*

a little more coarsely punctured than the head. *Elytra,* punctuation like pronotum but not so close. *Ventral Surface,* mesosternum and metasternum with large, coarse, rounded, deep punctures; the ventral punctures the same but about half the size.

Length: ♂ 2 mm. *Width*: 1.50 mm.

Type.—♂ and one cotype ♂ in my collection.

Type locality.—Goldfield, Esmeralda Co., Nev., June 10, 1908 (Nunenmacher).

This species is an intermediate form between *H. simulans* Casey and *H. ploribunda* Nun. It was taken on the Montezuma Mountains (6000 to 7000 ft. alt.), on sage brush.

Scymnillus cochisiensis n. sp.

Color, shining black throughout. *Form,* broadly oval, convex. *Head,* coarsely and thickly punctured and pubescent, the latter very short. *Pronotum,* not as coarsely punctured as the head, the punctures a little coarser and closer at sides, the pubescence confined to the sides and a narrow margin in front. *Elytra,* finely but not closely punctured. *Ventral Surface,* finely and closely punctured, becoming coarser at sides.

Length: ♂ 1.05 mm.; ♀ 1.25 mm. *Width*: ♂ 0.75 mm.; ♀ 1. mm.

Type.—♂ ♀ and eighteen cotypes in my collection.

Type locality.—Benson, Cochise Co., Ariz., October 4, 1906 (Nunenmacher).

In this species, the metacoxal line curves to meet the first ventral suture, but does not quite reach it; it passes obliquely and joins the posterior angle of the first ventral suture.

I wish to express my thanks to my friend, Dr. E. C. Van Dyke, of San Francisco, for advice and criticism during the preparation of this paper.

Infantile Paralysis Transmitted by the Stable Fly. (Dipt.).

The successful transmission of infantile paralysis in monkeys through the bite of the blood-sucking stable fly (*Stomoxys calcitrans*) has been announced by Prof. M. J. Rosenau of the Harvard Medical School and C. T. Brues of the Bussey Institution, Harvard University, and their results have been confirmed by Dr. J. F. Anderson of the Public Health and Marine-Hospital Service.

The hypothesis advanced last year by Brues and Sheppard that the stable fly is the carrier of this disease has thus been given experimental proof, although it is still possible that other channels of infection may exist. With the exception of the investigations of Dr. Anderson, the work was done under the auspices of the Massachusetts State Board of Health.

Studies of Some Pipunculidae from the Eastern United States (Diptera).

By E. T. Cresson, Jr., Academy of Natural Sciences, Philadelphia, Pa.

This paper is the results of a study of a small collection sent to me by Mr. C. W. Johnson, of the Boston Society of Natural History, for determination. It is rarely the case when a collection of this family is studied, that there are not some new forms brought to light. So we find, even in this small amount of material, a new species and several of the opposite sex of those heretofore described. This paper should be used in conjunction with my monograph of this family (1) to which I often refer. I wish here to acknowledge my indebtedness to Mr. C. W. Johnson for the loan of his type of *P. fallipes* and other specimens, and especially to Dr. P. P. Calvert for his kindness in examining the type of *lateralis* Walker in the British Museum of Natural History, and to Mr. E. E. Austen for granting Dr. Calvert the privilege to examine this type for me.

Mr. Nathan Banks, while in London during his attendance at the Second International Entomological Congress, made a few notes on Walker's types of *lateralis, reipublicae* and *translatus*, but not having made an especial study of this group and having no specimens along for comparison, he unfortunately did not consider many of the most important characters in his notes and sketches. However, they give some new light upon these species, especially *lateralis*, and as he kindly turned over these notes to me, I am indebted to him mainly for the results here obtained relative to these species.

Pipunculus affinis Cresson.

One male, Buena Vista, N. J., July 10th.

Agrees with the description but the stigma is less than one-half as long as the following section.

In my typical description of this species (2) the ";" after

(1) Trans. Amer. Ent. Soc. XXXVI, 267-329. pls. v-ix, 1911.
(2) Trans. Amer. Ent. Soc. XXXVI, 283.

"more or less developed" in the 14th line from the top of the page should be omitted.

P. globosus n. sp.

Allied to P. *aequus* Cress., but the antennae are black; legs black except knees and extremities of tibiae; ovipositor short, yellow, with black, globose base. Front subopake, shining only at vertex, becoming silvery towards antennae, with an evident, narrow, median shining stripe; antennae abruptly long acuminate (Fig. 12) (1). Mesonotum subopake, brown, lateral margins cinereous, anterior angles more silvery; scutellum cinereous; humeri yellowish; pleurae and metanotum cinereous; halteres brown. Abdomen elongate, subparallel laterally, subopake, brownish with lateral angles of segments cinereous; first segment with small lateral comb of black bristles; fifth and sixth subequal, longer than fourth. Ovipositor short, reaching only to apex of fourth, yellow, abruptly attenuating from a rather small shining black, globose base (similar to Fig. 81). Nearly all tarsi yellow. Wings hyaline, stigma equalling 4th section, fifth, one and a half times fourth; fourth vein simple. Length 3 mm., wing 4 mm.

Type Locality.—Buttonwoods, R. I.

Type.—Female, collected July 25, 1911. In the collection of the Boston Society of Natural History.

P. fuscus Loew.

In the 14th line from the top of the page (3) of my description, the "humeri" should be black instead of "yellow," thus reading, humeri black and halteres yellow.

P. biscaynei n. sp.

Antennæ with third joint yellow, long white acuminate; humeri black; abdomen subopake to opake, densely cinereous laterally; ovipositor extending to base of abdomen, yellow, gradually tapering from an elongate globose base; 6th segment of abdomen slightly longer than 5th; legs entirely yellow; stigma colored, equalling following section and shorter than 5th section; fourth vein forked.

Seemingly allied to *P. brevis* Cress., but differing from the description of that species (I have not the type before me) as follows: Front mostly shining black, only silvery a little above the antennæ, constricted towards vertex; occiput normal; knob of halteres entirely yellow. Abdomen subopake to opake; first, lateral and ventral margins of 2-4, 5th except a median stripe, and entire 6th segments, densely cinereous, the dark portions subopake, brown pruinose; 5th segment

(3 Trans. Amer. Ent. Soc. XXXVI, 301.

a little longer than 6th; ovipositor reaching base of abdomen. Legs, except coxæ, entirely yellow; femora spinose only beneath. Wings long, hyaline; colored stigma equalling 4th section; 5th section about 1½ times the stigma in length; 4th vein with fork. Length, 3 mm. Wings 4 mm.

Type Locality.—Biscayne Bay, Fla. Mrs. Slosson, Collector.

Type.—Female in the Collection at the Academy of Natural Sciences of Philadelphia. No. 5255.

P. constrictus Banks.

A male and a female from Florida possessing all the characters of this species, according to the description of the type, which is a male, with the exception of the constriction of the abdomen. It seems that this peculiarity may be an abnormality possessed by the type specimen. The male above referred to, is from St. Augustine and is the specimen noted under *P. houghi* Kert. in this paper, as Dr. Hough's determination of Walker's *lateralis*. It is no doubt Bank's species, or a very close ally (I have not the type of *constrictus* before me). The female is from Biscayne Bay, collected by Mrs. Slosson, and agrees with the male with few exceptions: The front is narrower at the vertex, shining black except just above the antennae where it is silvery; the antennae are acuminate.

P. houghi Kertz. (**lateralis** Walk. non. Macq.).

femoratus Cress. Tr. Am. Ent. Soc., XXXVI, 302, 1911.

As is generally the case, little or no satisfaction can be derived from the study of Walker's descriptions, and so we find, in this family, that his description of *lateralis* applies equally well to several species having yellow legs and shining abdomen. In my former paper (4) I considered Johnson's *pallipes* to be the same as Walker's species, but Mr. Johnson would not have it so, and therefore he loaned me the type of his species, also a specimen from St. Augustine, Florida, which he had, and which he said had been examined by Dr. Hough and Mr. Coquillett, and considered by them to be *lateralis*. Of course, having this specimen before him as *lateralis*, he was right in his denials. The most important difference be-

tween these two, is the forking of the fourth vein in the St. Augustine specimen. Therefore according to our present classification, this would throw these two into entirely separate groups, although I am rather doubtful that this character is of so much importance as that. The question then arose, is this Florida specimen a true *lateralis?* Dr. Calvert's sketch of the wing and Mr. Banks' notes, and sketch of the ovipositor, for the type is a female, at once settled this query and revealed the fact that we have an entirely different species, in *lateralis* Walker than we had surmised. The fourth vein is normal, not forked, the ovipositor is long, and tapering from an elongate base, and the post-femora are thickened and spinose. This at once suggests my *femoratus*; in fact, I do not hesitate to consider them synonymous.

Therefore my determinations as *houghi* Kertz., should be changed to *pallipes* Johns, and those as *femoratus* Cress. changed to *houghi* Kertz.

P. pallipes Johnson.

houghi (Kertz.) Cress. Tr. Am. Ent. Soc., XXXVI, 308, 1911.

Before me is another female of this species from Ithaca, N. Y., August 14, 1904 (C. W. Johnson), which varies a little from the description of this species given in my previous paper referred to (4). The upper half of the front is polished; second antennal joint black; abdomen rather obscurely shining, finely granular, with segments 2-4 distinctly yellow laterally; joints of the post tarsi not noticeably flattened or serrated.

P. reipublicae Walker.

Mr. J. R. Malloch, of the Bureau of Entomology at Washington (5), thinks that this species may be the same as *P. atramontensis* Banks (6) on account of the coloration of the femora. From the notes and sketch made by Mr. Banks, of Walker's type, the abdomen is broad, with the hypopygium large, which characters would seem to indicate *albofasciatus* Hough, rather than Bank's species; the latter having a moder-

(4) Trans. Amer. Ent. Soc., XXXVI, 308.
(5) Proc. U. S. Nat. Mus., XLIII, Hod, 291, 1912.
(6) Trans. Am. Ent. Soc., XXXVI, 312, 1911.

ately slender abdomen and a less developed hypopygium. As to the coloration of the legs, those of Walker's type may have been bleached or faded, leaving only the base of the femora black. I am inclined to consider *albofasciatus* rather than *atramontensis* as the synonym.

P. translatus Walker.

Evidently belonging to the *subvirescens* group, in which case a very close examination is necessary to establish its true position, but it will probably prove to be *subvirescens* Lw. The type is a male with the head missing.

P. subvirescens Loew.

Upon examining a female from Opelousas, La., June, '97, determined by Dr. Hough as this species, the following are noted: Similar in most respects to *similis* Hough, as I have described (7), but the abdomen is more cylindrical, not apparently ovate or flattened on the dorsum, and the incisures are not constricted; bare, and the black hairs not noticeable apically; femora and trochanters without basal bristles; otherwise I can see no difference. There may be a possibility that in associating the sexes of these species in my previous paper I have transposed the males or females of this species and *similis*, if any importance can be placed upon the bristles at the base of the femora. *Subvirescens* male has these present, but they are weak or absent in the male of *similis*, according to my determinations, while with the females, as I have them distributed, it is just the reverse.

P. appendipes Cresson.

One female. Tifton, Ga., Sept. 30, '96.

This specimen agrees with the typical description of the female of this species, except that the abdomen here is not quite shining, seeming to be minutely granular. This is one of the difficult *subvirescens*-group, and it is almost impossible to satisfactorily determine some of the species, especially those without the peculiar characters which many possess, and it will take large series and much study to straighten out this group especially as to the females.

(7) Trans. Amer. Ent. Soc., XXXVI, 315.

Oligotropic Bees (Hym.).

By CHARLES ROBERTSON, Carlinville, Illinois.

In an article in the Popular Science Monthly, Aug. 1912, pp. 197-203, Mr. John H. Lovell says: "When a female bee in gathering pollen for brood-rearing visits but one kind of flower it is termed a monotropic bee, or if only a few allied species an oligotropic bee; but if it visits many flowers it is called a polytropic bee. These terms were first proposed by Dr. Loew, and signify adapted to one, few or many flowers." This statement is correct, if one understands that Loew never used these terms in the sense here indicated. Loew's terms were not originated to apply to bees with reference to their pollen-collecting habits. They were not applied particularly to bees which collect pollen, but were also used with reference to inquiline and male bees. And pollen-collecting habits were not considered by Loew in determining the application of the terms. Indeed in this article Lovell does not always use them in that sense, for he includes species of *Epeolus* among oligotropic bees. *Epeolus* is a genus of inquilines.

Referring to *Halictoides novae-angliae*, he says: "Apparently in this region it never visits any other flower—it is a monotropic bee." On page 202 he says: "Dr. Graenicher writes me that the pickerel-weed bee (*Halictoides novae-angliae*) is found in Wisconsin; but the pickerel-weed does not flourish in the same locality, and so this bee is compelled to visit the blossoms of other plants." And, therefore, if "visit" means "visit for pollen," *H. novae-angliae* is not a monotropic bee.

Regarding *Halictus nelumbonis* and *Nymphaea advena*, he says, "This bee in this locality is never found on any other flower, but elsewhere is met with on other species of the water-lily family, or Nymphaeaceae." If the readers of the Science Monthly understand "*is met with*" to mean "*collects pollen of*," this will do, but, otherwise, this is an error, for the bee has been recorded as a nectar visitor of *Eriocaulon gnaphalodes, Utricularia inflata, Berlandiera subacaulis,* and *Verbena urticifolia* (Am. Nat. 36:599, 1902).

But, what is more, *Evylaeus nelumbonis* does not get pollen exclusively from flowers of Nymphaeaceae, but it also collects pollen of *Sagittaria latifolia.* The Nymphaeaceae have been regarded as primitive forms of Monocotyledons and they may be related to the Alismaceae; but, until this is proved, *E. nelumbonis* must be regarded as polytropic in the sense here used.

On page 198 it is stated that in Washington County, Wisconsin, according to Dr. Graenicher, twenty-four of the forty-seven indigenous species of *Andrena,* sens lat., are oligotropic. That is 51 per cent. At Carlinville, Illinois, after observing 595 visits of 51 species, I regard 24 species as *oligotropic.* That is 47 per cent. and two of the species are doubtful. Of the species named in my list, Flowers & Insects XIX, Bot. Gazette 28:36, 1899, *A. nasonii* and *geranii* are not oligotropic. Graenicher and I have found the latter collecting pollen of *Hydrophyllum virginicum.* I have also found it collecting pollen of *Blephilia ciliata.*

On page 200 we read "This is certainly a very singular habit on the part of bees, and one which could hardly have been foreseen." On the contrary, it is a phenomenon which finds an analogy in almost every considerable group of living things.

On page 201 Lovell says: "The oligotropic habit is not beneficial to flowers, it concerns the bees alone." On page 202 he says: "All bees including the honey bee show a strong tendency in collecting both nectar and pollen to be constant to one species of flower. This is manifestly for the advantage of both insects and flowers."

"The four species of *Andrena,* which in this locality visit exclusively the willows, do not thus avoid competition nor do they thus benefit other bees" (200). But they avoid competition with related species which collect pollen from entirely different flowers.

In the Botanical Gazette, 28:30, is this statement: "Of thirty-three species whose habits are pretty well known, nineteen are polytropic and fourteen oligotropic, in the sense in which I use those terms. Four of the oligotropic species get

pollen from plants of the same genus, but each of the other ten has its own flower, so there are eleven sets which are absolutely without competition among themselves. I think it is clear that so many species could hardly flourish in the same locality and complete their flight in so short a time, if all were in competition for the pollen of the same flowers." This refers to vernal Andrenas and the four species are oligotropes of *Salix*. If the several species of *Salix* afford an unusually rich supply of pollen, it is not inconsistent with the theory of avoidance of competition, if several oligotropic *Andrenas* compete for their pollen.

Lovell also says: "The social bees, as a rule, visit a great variety of flowers, though in Europe it is stated that there is a bumble-bee (*Bombus gerstäckeri*) which visits a single species of monkshood (*Aconitum lycoctonum*)." In this form the case is a nature-fake, as pointed out in the Botanical Gazette 28:34, 1899. In his Handbuch der Blütenbiologie, 114, Knuth says that *Bombus gerstäckeri* visits exclusively the flowers of *Aconitum lycoctonum*. This is simply a misstatement of an observation of Dalla Torre. This author did not say and did not suppose the *B. gerstäckeri* limited itself to *A. lycoctonum*, but only the female did. The males and workers have different habits and the difference was designated by the term *Heterotrophy*. Not even does the female limit itself to *A. lycoctonum*, for it was observed by Frey-Gessner and Hoffer on *A. napellus* (Vol. 2:52, 54). This still limits the female to *Aconitum*. They are apt to spoil this, if they keep on observing the habits of *B. gerstäckeri*.

In a paper on *Colletes* (Univ. Neb. Cont. Dept. Ent. No. 1) on page 14, Mr. M. H. Swenk refers to my statement that *C. brevicornis* is an oligotropic visitor of *Specularia perfoliata* and says: "In Nebraska, however, it visits also the closely allied *Campanula rotundifolia*, while I have a female taken on *Melilotus alba*. In Texas it occurs on *Callirhoe involucrata* and *Asclepias latifolia*, while the types of *opuntiae* were taken on *Opuntia* and *Campanula*." I have taken the male on *Pastinaca* and the female on *Psoralea*. Mr. Swenk evidently mis-

takes the sense in which I have used the term oligotropic. I think it will be found that *C. brevicornis* does not collect pollen of any of the plants he mentions, except *Campanula,* and that would not be unexpected in the case of a supposed oligotrope of *Specularia.*

Variation in the Stridulations of Orthoptera.

By H. A. Allard, U. S. Dept. of Agriculture,
Washington, D. C.

Many musical Orthoptera may be readily identified by their characteristic stridulations. It must be remembered, however, that all individuals of a given species do not always stridulate in quite the same manner. The usual stridulations may be more or less modified by a variety of external conditions, or even voluntarily changed from time to time by the insect. These differences may be classed as individual, accidental, local or geographic and volitional.

Independent of optimum conditions of existence, individuals of the same species or variety always show considerable variation in the intensity and rapidity of delivery, but more especially in the pitch of their notes. These differences are inherent in the individual make-up of the insect.

Inherent individual peculiarities of stridulation are likewise considerably modified by accompanying atmospheric conditions, especially temperature and moisture relations. Variable modifications of this sort are accidental in the life of the insect. Among the crickets these accidental modifications are more especially noticeable in the notes of intermittent trillers, such as *Oecanthus niveus* DeG., *Oecanthus angustipennis* Fitch, *Cyrtoxipha columbiana* Caudell, *Orocharis saltator* Uhler and others, since the rate of delivery of the successive trills is quite dependent upon attending temperature conditions. In general, higher temperatures stimulate brisk, rapid trillings, while low, unfavorable temperatures diminish the intensity and rapidity of the notes. The pitch, however, is not materially changed.

In New England, with the appearance of frosty evenings in late autumn, the intermittent stridulations of the snowy tree cricket *Oecanthus niveus* DeG. become painfully slow and faint as compared with the usually brisk, emphatic stridulations of this species during hot midsummer nights. Notwithstanding this response in the notes of insects to changing weather conditions, the characteristic habit of stridulation of any species is not sufficiently changed to make its identification uncertain. However unfavorable the conditions may be, *Oecanthus niveus* does not forsake its intermittent trilling habit, nor does the prolonged trill of *Oecanthus latipennis* become interrupted or in any way intermittent.

Among the species of musical Orthoptera covering a wide range of distribution it would be rather anomalous not to find in some instances more or less marked local peculiarities of stridulation and habit. Differences in the manner of stridulation distinguishing groups of the same species have been rarely reported. Concerning *Gryllus pennsylvanicus* Burm., one of the commonest and most widely distributed field crickets in North America, the writer has reported two extremely unlike habits of stridulation, differentiating New England from the most southern forms.* In New England the note is a distinct, intermittent chirp. In the Piedmont region of northern Georgia the note is a weak prolonged trill very much like the trill of *Oecanthus quadripunctatus* Beut. The writer has likewise noted rather distinct methods of stridulation for different colonies of *Nemobius fasciatus* var. *vittatus* DeG. at Oxford, Mass.† It is probable that more thorough investigation will reveal peculiarities in the stridulations of local groups of other species.

The usual method of stridulation of a species is sometimes noticeably changed, apparently at the will of the musician. The category of volitional modifications includes changes of

*"Musical Crickets and Locusts in North Georgia," Proceedings of the Entomological Society of Washington, Vol. XII, 1910.

†"Some New England Orthopters observed in late October," in Entomological News, Vol. XXI, 1910.

this nature. Several species of katydids have been observed to vary their characteristic notes from time to time. Scudder reports a few instances, including *Stenobothrus curtipennis* Harris and *Scudderia curvicauda* DeG. The writer's observations include *Scudderia texensis* S. & P., *Amblycorypha rotundifolia* Scudd. and *Amblycorypha uhleri* Brunner.

The usual note of *Scudderia texensis* is a soft, shuffling note, sh-sh-sh-sh-sh, at other times the call becomes a sharp, rasping, zeet-zeet-zeet-zeet, which usually calls forth a similar response from the others within hearing. The writer first studied these notes at Oxford, Mass., in September, 1910.* These modifications apparently were quite independent of appreciable differences of sunshine, shadow, etc.

The stridulations of *Amblycorypha rotundifolia* may consist of brief, soft, shuffling phrases, sh-sh-sh-sh, repeated at intervals. At other times the notes become more lisping and continuous, tsip-i-tsip-i-tsip-i-tsip. The different call notes of this katydid are very similar to those of the smaller *Amblycorypha uhleri*. The notes of the latter at times consist of a rapid, silken, shuffling sound, sh-sh-sh-sh, occasionally repeated. At other times the notes become brief, staccato lisps, i-tsip-i-tsip-i-tsip, followed by the usual phrases sh-sh-sh-sh. Abrupt modifications of this sort nearly always get a similar response from other individuals.†

In a study of the stridulations of Orthoptera it is important that the careful observer should avoid the conclusion that a certain species has but a single note. It is evident that a number of species are capable of modifying their stridulations considerably at will. In some instances it appears that these particular calls bear some unknown relation to changes in environmental conditions. It is highly probable that they are often more or less vitally connected with certain obscure social relationships of the species.

*"The Musical Habits of Some New England Orthopters in September," in Entomological News, Vol. XXII.

†"The Stridulations of Some 'Katydids,'" in Proceedings of the Biological Society of Washington, Vol. XXIII, 1910.

New North American Diptera.

By W. R. WALTON, Bureau of Entomology,
Washington, D. C.*

Agromyza davisii n. sp. (AGROMYZIDAE).

Length 2 mm. Front, cheeks and proboscis yellow. Antennae, palpi, occiput and ocellar triangle black. Thoracic dorsum, scutellum and pleurae opaque blackish, strongly bristled. A line over the mesopleura pale yellow. Abdomen black, somewhat shining, sutures pale greenish yellow. Genitalia shining black. Legs and feet entirely black. Squamae, halteres and bases of wings yellow.

This species belongs to Meigen's group "C" (c) in which the cross veins are approximated and confined to the basal fourth of the wing, front yellow.

Described from two specimens, male and female, reared from the leaves of *Ranunculus abortivus*, in which it mines, by J. J. Davis, Lafayette, Indiana, and in honor of whom it is named.

Type deposited in U. S. Nat. Museum, Washington, D. C.

Microdon craigheadii sp. nov. (SYRPHIDAE)

Microdon laetus Walton (not Loew), Ent. News, XXII, p. 319, 1911.

In Vol. xxii, p. 319, of ENTOMOLOGICAL NEWS the author published a note on *Microdon laetus* Loew. Additional material has since been received and in going over this, in comparison with a specimen in the U. S. National Museum which is labelled "*M. laevis* Loew," the two forms are evidently abundantly distinct. Now as there is no such species as "*M. laevis* Loew," and as the specimen referred to above agrees closely with Loew's description of *laetus* and is furthermore from Cuba, the type locality of *laetus*, it becomes obvious that the Pennsylvania specimens constitute a new species to which the name *Microdon craigheadii* is herewith given. To the previous description (*l. c.*, p. 320), the following details may be added:

Male.—Head about as wide as thorax, face three-quarters as wide as eye; eyes nearly bare.

*Published by permission of Chief of Bureau.

Female.—Cross veins slightly infuscated. Length 11-12 mm.

Type.—One specimen, Carlisle Junction, Pa., F. Craighead.

Paratypes.—One specimen, Enola, Pa., H. F. Adams. Rockville, Pa.; one specimen by author, others by A. B. Champlain.

Type in U. S. Nat. Museum, Washington, D. C.

M. laetus Loew has distinctly hairy eyes, head wider than thorax, face not more than half as wide as either eye, abdomen more narrowed posteriorly, whole color more violaceous than *M. craigheadii* and wing veins, especially cross veins, heavily stained with brown.

Fragments on North American Insects—II.

By A. A. GIRAULT, Nelson, Cairns, North Queensland.

1. **More Notes on Estigmene acreae. (Lepid.).***

A female of this species was captured from grass at Blacksburg, Virginia, May 16, 1902, and upon rough confinement began to deposit eggs. The rate of deposit was regular, an egg being laid about every twenty seconds, or three every minute. Oviposition commenced about 3 P. M., May 16, and continued until the early morning of May 17; the total number was one thousand one hundred and twenty-nine. The eggs commenced to hatch at about 8 A. M., May 23, 1902; two had hatched by 10 A. M., and by the afternoon of the same day a hundred or more. Hatching was then becoming general. The eggs were deposited upon a thin network of hairs and attached by means of a yellowish-brown secretion. The first molt occurred on May 26; another on June 10, and by July 2 a few of the caterpillars had spun cocoons. At that date, however, the majority were yet feeding. By July 6 all had spun cocoons. The larvae had been fed upon wild plaintain and grasses. The adults issued the first week in August.

2. **Megalopyge opercularis Smith and Abbot. (Lepid.).**

On October 5, 1902, larvae of this species were received from a correspondent at Lynnhaven, Princess Anne County,

*See No. 8, page 406, *antea*.

Virginia. They were already cocooned. On the twentieth of the same month they were opened, exposing the caterpillar, now nearly naked from the fact that its clothing of long hairs had been used to make the peculiar, lidded cocoon.

3. **A Courting Habit of Epicauta. (Coleop.).**

The male of *Epicauta cinerea,* when courting, strokes the body of the female from end to end with its long antennae, in the meanwhile making frequent advances by attempting to unite with her. The male is repulsed time after time, but continues the monotonous performance for long intervals. Sexual union continues for hours.

4. **Notes on Solenozopheria vaccinii Ashmead. (Cynipoidea, Hym.).**

The tuber-like galls of this species were obtained at Cumberland, Maryland, on huckleberry, August 16, 1903. The identification was made by Ashmead. They occur on the stems and branches and are fleshy but firm, pinkish-red in color or green flushed with pinkish; kidney-shaped to irregular and lobed; the larval cells are of medium size.

The galls on young plants appear to check growth; on older plants they cause stems to bend nearly upon themselves, the gall forming an elbow. The galls were occasional to common. The larvae at this date were immature, but parasites were issuing from the galls in numbers continuing up to September 9, 1903. On September 12, 1903, a gall of this species was found on huckleberry at West Annapolis, Maryland.

5. **On Callirhytis seminator. (Cynipoidea, Hym.).**

This beautiful gall is common in the vicinity of Blacksburg, Virginia, on white oak. A number of them were collected on June 24, 1903; at that date their age varied, but adults were emerging from the mature galls. The young galls consist of a radiating mass of larval cases on a common receptacle at the end of a twig at the base of a leaf petiole. Each larval case is surmounted by a glossy white substance resembling glass wool, and which by combination with that of adjoining cases forms a complete, globular and more or less compact woolly ball. As the galls increase in size and approach maturity, the

larval cases lengthen from their distal end and push the woolly substance out into point-like protuberances. The galls turn brown when maturing. They may also be found along the side of a twig, in one case the receptacle being formed on a developing bud. The eggs of this cynipid are probably deposited within a bud. The galls are large and conspicuous, flower-like at times and bitter to the taste. There are commonly two receptacles, side by side, in the place of the two apical buds of the twig.

The young larval cases are seedlike and measure about three millimetres; they taper at the distal end and each bears a tuft of woolly substance. In the mature galls each case has become elongated into fleshy spokes, green and herbaceous, which measure about thirteen mm. in length, about half of which is the elongated distal end.

The adults issue through large holes at one side of the distal extremity of the larval case (the basal, swollen, seedlike portion of it) and tunnel their way through the surrounding substance to the open air, leaving for the time being a small shotlike hole; these soon close up owing to the nature of the gall substance. The adults emerge for a period of at least two weeks. The gall also occurs at Cumberland, Maryland.

Parasites are numerous; a golden-haired Eurytomid was reared from the Virginia specimens.

6. **The Galls of Rhodites bicolor. (Harris) (Hym.).**

On July 5, 1903, a number of the characteristic galls of this species were taken from wild Carolina rose growing in a boggy meadow near Blacksburg, Virginia. The cynipid larvae were then present and parasites had been emerging for some time. During the same year, though its host plant was abundant, the galls were rarer at Cumberland, Maryland, than in Virginia.

7. **Diastrophus nebulosus. (Hym.).**

This common gall of blackberry has been observed at Annapolis, Sparrow's Point (Baltimore) and Cumberland, Maryland; Ridgeley, West Virginia; Blacksburg, Virginia, and Paris, Texas.

At Cumberland, Maryland, August 9, 1903, it was not abundant, but such specimens as were seen were still green, the larvae only half-grown.

Four galls taken at Sparrow's Point, Maryland, in December, 1903, and kept in confinement yielded parasites and adult cynipids at Paris, Texas, March 18 to April 1, 1904.

8. **Diastrophus cuscutaeformis. (Hym.).**

This blackberry gall was found May 5, 1903, at Blacksburg, Virginia, along the side of a low mountain spur. From sixty larval cases only four contained a pupa of the cynipid, four a chalcidoid pupa, while the rest were empty.

9. **Sphecodina abbotii Swainson. (Lepid.).**

A male larva of this species was taken from cultivated grape at Blacksburg, Virginia, June 30, 1902. It pupated on July 3.

10. **Number of Chalcidoid Parasites from a Noctuid Pupa. (Hym.).**

Four hundred and twenty-one pteromalids were reared from an unknown noctuid pupa at Blacksburg, Virginia, May, 1903. This is not a large number.

11. **Trypeta solidaginis. (Dipt.).**

On February 11, 1905, a gall of this species was taken from golden-rod at Arlington, Virginia; the contained larva was full grown and pupated five days later, emerging on March 18 following. The galls also occur at Arundel, Maryland.

12. **The Length of Life of Thysanura (Entomobryidae) in Confinement.**

On November 9, 1902, I captured many specimens of a thysanuran from beneath the very moist bark of an oak. They were placed into a narrow vial, in the bottom of which was a little damp soil covered by moss. A stopper of damp cotton prevented escape. After the moisture in the earth had evaporated the insects clustered about the damp cotton plug. All remained alive up to December 9, but by the 16th of that month the plug was allowed to dry and death rapidly ensued, all dying by the 19th.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., DECEMBER, 1912.

In another column of the present number of the NEWS we print some announcements of the meetings of entomological societies to be held at Cleveland, Ohio, during the Christmas holidays, in affiliation with the American Association for the Advancement of Science. This year the American Society of Zoologists, both Eastern and Central branches, will also meet (December 30 to January 1) in the same city as the Association, instead of elsewhere, as was the case last year. This will bring entomologists and zoologists together, a conjunction always desirable. The Entomological Society of America, by its Executive Committee, has decided that it is necessary to limit each paper on its program to fifteen minutes and to place second titles at the end of the program, thus following the procedure already adopted by the zoologists and others. Although this may be regarded as a hardship by some, there can be no doubt but that these two rules will work for the benefit of the majority. We sincerely hope that the meetings will prove to be very successful and productive of good.

Synonymical Note on Haematopinus phacochoeri Enderlein. (Malloph.).

Haematopinus peristictus Kellogg and Paine (Bul. Ento. Research, Vol. II, July, 1911) is the same as Enderlein's *H. phacochoeri*, which was well described and figured by him in the Contributions to Sjostedts Kilimandjaro-Meru Expedition, 1908, Pt. 11, Anopleura. Both lots of material were taken on *Phacochoerus*, a genus of wild hog, from East Africa.—J H. PAINE, Forest Hills, Mass.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

The Entomological Society of America.

The sixth annual meeting will be held in Cleveland, Ohio, Tuesday and Wednesday, December 31, 1912, and January 1, 1913, in affiliation with the meetings of the American Association for the Advancement of Science and other affiliated societies. Meetings will be held Tuesday forenoon and afternoon, beginning at 10:00 A. M., and on Wednesday forenoon. There will be a full week of entomological meetings; the preliminary program, as outlined, is as follows:

The meetings of the Entomological Society of America will be held on Tuesday morning and afternoon and Wednesday morning. The public address will be given on Wednesday evening at 8:00 P. M.

The American Association of Economic Entomologists will convene at 1:00 P. M. on Wednesday with the Presidential address at this session. Other sessions will be held Thursday morning and afternoon and Friday morning.

The first meeting of The American Association of Official Horticultural Inspectors will open on Thursday evening with the President's address. The other meetings will be held on Friday afternoon and evening.

Every member of the Entomological Society is urged to contribute to the program. To obviate the crowding out of papers, the Executive Committee has decided that *each paper will be limited to fifteen minutes. Second titles will be placed at the end of the program and read in the order listed.*

The by-laws provide that there shall be held at the annual meeting a technical exhibit of entomological materials and methods. Any photographs, drawings, specimens, novelties, apparatus, or other matter of interest to entomologists will be heartily welcomed. This will remain open during the entire period of the meeting, for the examination at their leisure, of those interested.

The annual public address will be given by Dr. Philip P. Calvert, of the University of Pennsylvania, Philadelphia, on Wednesday evening, January the first, at 8:00 P. M. His subject will be "An Entomologist in Costa Rica." The lecture will be illustrated by lantern slides.

The annual business meeting will be held Wednesday morning, January 1st, for the reports of the treasurer, editor of the Annals, Auditing Committee, Committee on Nomenclature, the election of new members, and the transaction of all other business.

The Secretary of the American Association for the Advancement of Science furnishes the following information: "Cleveland is in the ter-

ritory of the Central Passenger Association. Owing to legislative acts reducing fares in that territory to a two (2) cent a mile basis, the Central Association cannot make a further reduction by authorizing the certificate plan of a fare and three-fifths for the round trip. With the Central Association granting no special rate, the other Passenger Associations will not grant any special rates other than such excursion fares as may be in effect at the time of the meeting."

The hotel headquarters for the Entomological Society of America will be the same as that of the American Association of Economic Entomologists, which will be announced later. [See below.]

All persons interested in entomology in Canada and the United States should be members of the society. There are many persons in the two countries that would be glad of membership if it were only called to their attention. An increase in membership means more funds and a consequent enlargement in the size of the Annals. Nominations should be in the hands of the Secretary not later than December 31st. The Secretary should be addressed at Cleveland, Ohio, after December 20th, in care of the Secretary of the American Association for the Advancement of Science.—STEPHEN A. FORBES, *President*, ALEX D. MACGILLIVRAY, *Secretary-Treasurer*, University of Illinois, Urbana, Illinois.

The American Association of Economic Entomologists.

The Twenty-fifth annual meeting will be held in Cleveland, Ohio, January 1-3, 1913, in the Normal School Building, which is located between Euclid Avenue and East 107th and 115th Streets, four miles east of the center of the city.

The opening session will be called to order at 1 P. M., Wednesday, January 1st, when the address of the President of the Association will be delivered. The meeting will be continued Thursday, in the morning and afternoon, and the final session will be held at 10 A. M., Friday, January 3rd.

The hotel headquarters for this Association have been secured at Hotel Euclid, which is located at Euclid Avenue, 14th and Huron Streets, in the central part of the city. Rates ranging from $1.50 per day and up for single rooms have been secured on the European plan. Members are urged to make hotel reservations as soon as possible, as the number of rooms available at the lower rate is limited.

In view of the information concerning railroad rates given under the preceding announcement of the Entomological Society of America, it is suggested that advantage be taken of such excursion fares as may be in effect at the time of the meeting. Members should, therefore, consult their local ticket agents regarding routes and rates. Parlor and sleeping car accommodations should be reserved in advance.

From the States of California, Nevada, Oregon, Washington and west of, and including, Mission Junction, B. C.; also, from what are known as Kootenay common points, namely, Nelson, Roosland, Sandon, Kaslo and Grand Forks, B. C., the Transcontinental Passenger Association has on sale daily Nine-Months Tourist Fares, approximating two cents per mile in each direction, or about one fare and one-third for the round trip. The nine-months fares apply to the eastern gateways of the Transcontinental territory, which are: Atchison, Kansas; Chicago, Illinois; Colorado Springs, Colorado; Council Bluffs, Iowa; Denver, Colorado; Fort Worth, Texas; Houston, Texas; Kansas City, Missouri; Leavenworth, Kansas; Memphis, Tennessee; Mineola, Texas; Minneapolis, Minnesota; New Orleans, Louisiana; Omaha, Nebraska; Pueblo, Colorado; St. Joseph, Missouri; St. Louis, Missouri; St. Paul, Minnesota.

Station Agents will cheerfully advise delegates as to the eastern points to which it will be most advantageous for them to purchase nine-months' tickets in rebuying through to Cleveland.

Proportionately higher fares are made to principal Atlantic seaboard points, and to interior points such as New York, N. Y.; Baltimore, Md.; Philadelphia, Pa.; Washington, D. C.; Boston, Mass.; Montreal, Quebec; Albany, N. Y.; Pittsburgh, Pa.; Buffalo, N. Y.; Detroit, Mich.; Toronto, Ontario; Cincinnati, Ohio; Indianapolis, Indiana; Atlanta, Georgia, etc.

The nine-months fares do not apply to intermediate or interior points, but only to what are known as the eastern gateways of the Association, such as those named, including also Colorado Common Points. Should it happen that delegates apply at a station on the Pacific Coast, from which the nine-months fare is not in effect, which may be the case at very small, unimportant stations, the agent will cheerfully ascertain and advise them the nearest point to his station, from which such fare does apply.

The official button of the Association will be supplied to all members whose dues are paid, including dues for the year 1913. These will be furnished at the meeting on application to the Secretary.—A. F. Burgess, *Secretary*, Melrose Highlands. Mass.

An Example of Protective Resemblance in a Satyrid Chrysalis. (Lepid.)

During June, 1904, I collected insects and plants near Mt. Pinos, Kern County, California. The little narrow valley in which the potrero is located is partly in the Upper Sonoran Zone, with the characteristic shrub of the Upper Sonoran and Transition regions of the Great Basin, the true, aromatic, Sage Brush, *Artemisia tridentata*, occurring mixed with the pines. A number of adult insects

were collected on this shrub, all showing a protective coloration, being a grayish green, just like the foliage of the *Artemisia*. I found a chrysalis which I did not at the time particularly notice, but put it in a box, where after a few days a *Satyrus*, sp. emerged, like those which were so common flying in the vicinity. The chrysalis was attached to a twig at least two feet from the ground, and was the same color as the vegetation, grayish green. This chrysalis case is preserved in my collection with the series of *Satyrus* from that region.—FORDYCE GRINNELL, JR., Pasadena, California.

The Synonymy of an Economic Species of Sawfly (Hym.)

HOPLOCAMPA COOKEI (Clarke).—*Dolerus cookei* (Clarke). Can. Ent. vol. 38, 1906, p. 351. *Hoplocampa* (*Hoplocampa*) *californica* Roh. Techn. Ser. No. 20, Part 4, Bur. Ent. U. S. Dept. Agr. 1911, p. 143. The accumulation of additional material and additional study on this species has proven that the two names apply to the same insect. The biology of Clarke's species also proves the identity. The type of *Dolerus cookei* is lost, having been destroyed in the San Francisco earthquake.—S. A. ROHWER, U. S. Nat. Mus., Washington, D. C.

A Phycitid Moth Swarming at Light (Lepid.).

In Boulder, Colorado, between 9 and 10 on the night of Sept. 5, 1912, I observed enormous numbers of a small Phycitid moth (*Homoeosoma electellum* Hulst) at the street lights, and even at the lights in the street cars. They were so abundant about the lights as to remind one of a heavy snow storm; during eight years at Boulder I have never seen anything like it. Mixed with them was a number of other species, which, however, hardly constituted 5 per cent. of the swarm. These other species, so far as I collected them, were *Euxoa contagionis* Smith, *Euxoa* sp., *Loxostege sticticalis* L., *Bandera cupidinella* Hulst, *Paltodora magnella* Busck, *Gelechia invariabilis* Kearfott. All these species were very kindly named by Dr. Dyar and (the last two) by Mr. Busck. Dr. Dyar states that *H. electellum* occurs from New Jersey to California, but its life-history is unknown.—T. D. A. COCKERELL.

The Occurrence of Cecidomyia foliora (Dipt.).

During the past two years the writer has found that *Cecidomyia foliora* R. & H., which was described, in Volume XIX, pp. 349-352 of the Entomological News, from specimens bred from a single tree, has quite a wide distribution. At Amherst, Mass., I have frequently found its galls on the leaves of *Quercus rubra* and *Q. coccinea* growing in the woods and during the summer of 1910 collected them at Black River Falls and City Point, Wisconsin on *Q. rubra*.—C. W. HOOKER, Mayaguez, Porto Rico.

A Tropical Butterfly in New Hampshire.

My dear Doctor Skinner—Will you be kind enough to tell me the name of a butterfly which alighted on the knee of a young woman at Intervale, New Hampshire? "It was about 4½ inches in expanse, of the bright, metallic blue seen in some of Denton's exhibited butterflies, with no markings on the blue, but a bright golden yellow edge around the four wings. The yellow edge had some small marks on it." It had no tails.

The person who saw this said that she never saw one like it before and her sister corroborates all the statements of color, etc. It seems to me an escape from some one's cage of chrysalids, or a tropical butterfly far astray.

The person is a rather more accurate observer than most non-entomological women, and is really desirous of knowing what her "vision of beauty" was. We both shall be grateful if you can tell us from this description.—Caroline Gray Soule.

May have been *Caligo atreus* or *uranus* from Central America, brought in chrysalis stage on a fruit steamer.—H. S.

On Labeling Specimens. A Suggestion.

On labeling specimens. A suggestion.—When a specimen is correctly named and placed in its proper position in the cabinet, or a new species described and duly named, that act is only a preliminary and comparatively unimportant proceeding; the name is the handle by which we will further study and communicate the results of such study of the species, in all the various relations of its natural history, economy, internal and external anatomy, distribution, etc. To do this further work we need a good knowledge of the environment of a species on which to base our studies; so we have the locality label. Very often this label is vague, inaccurate or indefinite, taken from a local or railroad map, the collector having the idea that the specimen and its taxonomy is the chief end of his endeavors. Some standard should be used, understood by everyone, and the *only* standards which are *permanent* and *accurate* are the topographic maps, termed quadrangles, being prepared by the U. S. Geological Survey. These sheets, about 17½ x 15 inches, include an area of 20 or 25 square miles, 1 mile to an inch, and more than one-quarter of this country has been thus mapped. The relief is shown by contour lines, so one can obtain at a glance the topography of the region. The name of the sheet is designated by the name of the principal town or some prominent natural feature, as: Watkins Glen Quadrangle, N. Y., or Tejon Quadrangle, Calif. So with a printed locality label for the particular *quadrangle,* with the date, collector, and exact locality indicated by a town, canon, peak, river, boundary lines, etc. on the specimen, a student can turn to the particular atlas sheet (which sheets are very convenient and beautiful

to study) and see at a glance the kind of territory which the species has evolved in. If collections and published references were labeled thus, a student of geographical distribution, for instance, could use such already accumulated data in his studies, instead of having to make special collections for such a purpose. It is evident that we possess taxonomic collections which are hardly useful for anything else; there is no reason why they should not be made doubly useful A very little thought on this subject ought to convince anyone of the desirability of such a course of labeling, as it will make specimens useful for many generations in the study of the "why and wherefore" of things, the specimen otherwise being useless, except for its taxonomy.

By addressing The Director, U. S. Geological Survey, Washington, D. C., information and lists of published maps for particular States may be obtained free. These maps are very cheap, 5 cents each, or 2 cents when ordered in lots of 100.—FORDYCE GRINNELL, JR.

Oviposition of Lixus concavus Say (Coleop.).

A brief note on this species published by Mr. A. A. Girault, p. 401, November number of NEWS, would almost lead one to infer that there had been no previous studies of the oviposition of this species.

In *Entomologica Americana,* Vol. V, pp.. 11-16, January, 1889, the writer gave a somewhat extended account of the oviposition of both *Lixus concavus* and *Lixus macer.* A few months later, in September, 1889, Doctor C. M. Weed published in Bulletin VI, Vol. II, of the Ohio Agricultural Experiment Station, some studies of the habits of *Lixus mucidus* under the name of *L. concavus.* There had been an earlier paper published by the late Mr. D. W. Coquillett in *Canadian Entomologist,* Vol. XV, p. 113, 1883, on similar habits of *Lixus macer.* Mr. Coquillett's observations were made at Woodstock, McHenry County, Illinois, while mine were made in DeKalb County, Illinois, and at Lafayette, Indiana. A second article by the writer, under the title of "Food Plants of Lixus," was published in the Proceedings of the Entomological Society of Washington, Vol. II, 1892, pp. 339-341. Still later, a more exhaustive article was published by Doctor F. H. Chittenden, Bulletin XXIII, n. s., U. S. Department of Agriculture, Division of Entomology, in 1900. This last article related entirely to *Lixus concavus.* While no special studies were made by Doctor Chittenden of the oviposition, nevertheless the paper contains references to previous publications, giving the distribution and a description of the earlier stages together with biological notes.

It will, therefore, be seen that Mr. Girault's paper is antedated by quite exhaustive studies of the oviposition of *Lixus concavus* and of other species of the genus.—F. M. WEBSTER.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in Heavy-Faced Type refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted. This (*) following a record, denotes that the paper in question contains description of a new North American form.

For record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

1—Proceedings, Academy of Natural Sciences of Philadelphia. **4**—The Canadian Entomologist. **6**—Journal, New York Entomological Society. **7**—U. S. Department of Agriculture, Bureau of Entomology. **8**—The Entomologist's Monthly Magazine, London. **10**—Nature, London. **11**—Annals and Magazine of Natural History, London. **22**—Zoologischer Anzeiger, Leipzig. **43**—La Cellule. **49**—Annales Historico-Naturales Musei Nationalis Hungarici, Budapest. **50**—Proceedings, U. S. National Museum. **59**—Sitzungsberichte, Gesellschaft der naturforschenden Freunde, Berlin. **62**—Handlingar, Konglige Svenska Vetenskaps-Akademiens, Stockholm. **79**—La Nature, Paris. **84**—Entomologische Rundschau. **89**—Zoologische Jahrbucher, Jena. **97**—Zeitschrift fur wissenschaftliche Zoologie, Leipzig. **102**—Proceedings of the Entomological Society of Washington. **118**—Memoirs and Proceedings, Manchester Literary and Philosophical Society, Manchester. **153**—Bulletin, American Museum of Natural History, New York. **166**—Internationale Entomologische Zeitschrift, Guben. **175**—Aus der Natur, Berlin. **179**—Journal of Economic Entomology. **180**—Annals, Entomological Society of America. **184**—Journal of Experimental Zoology, Philadelphia. **186**—Journal of Economic Biology, London. **196**—Arkiv for Zoologie, Stockholm. **200**—Bulletin Scientifique de la France et de la Belgique, Paris. **222**—Purdue University Agricultural Experiment Station, Lafayette, Ind. **233**—Iowa State College of Agricultural and Mechanical Arts, Experiment Station, Ames. **240**—Maine Agricultural Experiment Station, Orono. **244**—Zeitschrift, Induktive Abstammungs- und Vererbungslehre, Berlin. **254**—Archives de Parasitologie, Paris. **278**—Annales, Societe Zoologiques Suisse et du Museum d'Histoire de Geneve, Revue Suisse de Zoologie. **279**—Jenaische Zeitschrift fur Naturwissenschaft, **324**—Journal of Animal Behavior, Cambridge, Mass. **358**—Boletim

do Museu, Ceara, Brazil. **359**—Connecticut Agricultural Experiment Station, New Haven. **381**—Experiment Station Record, Washington, D. C. **390**—Zoologischer Beobachter, Frankurt a. Main. **393**—"Scientia," Bologna. **394**—Parasitology, Cambridge, England. **396**—Memoires de la Societe de Physique et d'Histoire Naturelle de Geneve. **397**—Pfluger's Archiv fur die Gesammte Physiologie des Menschen und der Tiere, Bonn. **398**—Pennsylvania Medical Journal, Athens.

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HOUSE-FLIES AND HOW THEY SPREAD DISEASE. By C. G. HEWITT, D.Sc., Dominion Entomologist, Ottawa, Canada. G. P. Putnam's Sons, New York, 1912. Price forty cents. 122 pages, 19 figures. This is an extremely well written little book by one who has contributed largely to our knowledge of the subject, and who is in a position to speak with authority.

The structure, life history and breeding habits, parasites and natural enemies are treated as well as chapters on their relation to the spread of disease. The book concludes with a chapter on preventive and control measures, bibliography and index. An inexpensive book of this kind should have a wide circulation and be a considerable factor in educating the people to take measures to do away with this dire pest and nuisance.—H. S.

POLYMORPHISM IN A GROUP OF MIMETIC BUTTERFLIES OF THE ETHIOPIAN NYMPHALINE GENUS PSEUDACRAEA. Nature XC, 36, 1912. In the above mentioned article Prof. E. B. Poulton gives a very interesting account of these butterflies and also their mimetic relationship to the Acraeine genus *Planema*. Dr. Karl Jordan came to the conclusion that *Pseudacrea eurytus* and its allies *hobleyi, terra, obscura, rogersi* and *imitator* were one species, based on studies of the genital armature of the male. Prof. Poulton studied large series from various localities and came to the conclusion that Dr. Jordan was probably correct in his opinion, but that at that time the final proof, breeding, was lacking. Dr. G. H. Carpenter recently found the egg of *obscura* in the Bugalla forest and succeeded in rearing it to the imago stage and it turned out to be *terra*, thus adding another link to the proof. Prof. Poulton hoped to be able to present this evidence before the Second International Entomological Congress, but the word (by cable) did not come until August 19th, after the Congress adjourned. Prof. Poulton says it is really a very striking case, probably more so than any that we shall discover in the future, because quite twelve species sink as mimetic modifications of *eurytus;* the case also differs in a very interesting manner from that of *Papilio dardanus*, because this latter is only mimetic in the female, whereas the Pseudacreas are so in both sexes.—HENRY SKINNER.

CONTRIBUTIONS TO THE NATURAL HISTORY OF THE LEPIDOPTERA OF NORTH AMERICA. By WILLIAM BARNES and J. H. MCDUNNOUGH, Decatur, Illinois.

Vol. 1, No. 4, "Illustrations of Rare and Typical Lepidoptera," July 1st, 1912. This consists of 27 plates containing over 500 figures of moths in black and white half-tone. Many of the moths figured are types and many from typical specimens compared with the types. There are notes in relation to many of the species. It is exceedingly laborious to identify moths from descriptions alone, and illustrations are of immense value, even if they are only a partial aid and it becomes necessary to verify from the descriptions. The authors give their experience in the use of photography in illustrating moths and

have arrived at the conclusion that a half-tone from a photograph gives the best result. The half-tones are not up to the standard of American work by this method and are much inferior to those made in Europe with similar copy. In spite of this, which may be remedied in the future, the work is a contribution of the greatest value to students and is a strong hint to others to do likewise in illustrating what they study.

Vol. 1, No. 5, July 10th, 1912. "Fifty New Species; Notes on the Genus *Alpheias*." Many new species of moths, mostly from the western and southwestern United States, are described in this paper. A study is made of the Pyralid genus *Alpheias* Ragonot. The characters of some of the genera are given with tables for their separation, and some new genera and species are described. Some notes and corrigenda are appended. Four plates with many figures follow the text.

Vol. 1, No. 6, "On the Generic Types of North American Diurnal Lepidoptera," July 25, 1912. The authors in this paper have used the "first species" principle and listed the genera accordingly "to see what the result would be." They give tables showing the result of the first species method, and alongside of each genus the result of Scudder's work by "elimination." Inasmuch as the Committee on Nomenclature of the International Zoological Congress has adopted a different plan of procedure, we are still in the dark as to which genus to use. It looks like a case of "go as you please." Genera are liable to give all but the strongest intellects brain-fever. However this may be, we are indebted to the authors for their views on an interesting though tiresome subject.—H. S.

THE MACROLEPIDOPTERA OF THE WORLD, By DR. ADALBERT SEITZ, PH. D.—This colossal work is published by Dr. Seitz with the help of an able corps of assistants, experts or authorities in the various branches of this immense subject. The study of the Macrolepidoptera has grown apace and for a time the illustrated works were entirely inadequate to cover the subject. Hundreds of new species were not figured and even those persons who had access to large libraries found it difficult to keep up-to-date. Of course, descriptions were available, but there are few persons that like the drudgery of relying solely on descriptions.

When we consider the fact that this work when completed will contain 930 plates and 39,000 figures in color we can realize what an undertaking it has been and how much it will contribute to our knowledge of the butterflies and moths of the world. The illustrations as a whole are excellent and the explanatory text as full as it could be, and the work kept within reasonable bounds. Good figures are essential in this study, as while they do not accomplish everything, they save an immense amount of time and, if necessary, one can always refer to

original descriptions for confirmatory evidence. Certain parts of the work are sold separately so that those persons who limit their studies may be accommodated. Volumes V to VIII are devoted to the species of North and South America and at present there have been issued of this section 334 pages and 79 plates.

It is expected that the entire work will be completed in the early part of 1914. The reasonable price of the parts places the work within the reach of all; it has been the great expense of many illustrated works which has excluded them from all but the wealthy and the great institution libraries. The work is issued in both German and English. The American agent is G. E. Stechert & Co., 151 W. 25th St., N. Y.—H. S.

Doings of Societies.

AMERICAN ENTOMOLOGICAL SOCIETY.

Meeting of June 10, 1912, being the first meeting held in the new entomological quarters of the Academy of Natural Sciences of Philadelphia. Dr. Calvert, President, in the chair. Nine persons present.

Dr. Skinner made some remarks on the damage done by the plum curculio and exhibited specimens of fruit containing their larvae. His own trees on his place at Ardmore, Pa., plums, peaches and apples, showed 100 per cent. injury. Not a single fruit was left to tell the story of what had happened.

Mr. G. M. Greene reported the great abundance of *Macrodactylus* and Syrphidae on the flowers of *Viburnum* at Gustine Lake in Fairmount Park.

Mr. Harbeck mentioned finding an Ortalid fly, *Callopistria annulipes*, on a dead locust tree at Trenton, New Jersey. The fly was found in some numbers. He also reported and exhibited a specimen of the tick *Dermacentor variabilis* taken from a boy's head.

Mr. Rehn said he and Mr. Hebard expected to spend three months in Texas this summer collecting Orthoptera.

Mr. E. T. Cresson, Jr., spoke of an apiculturist in the vicinity who was trying to get rid of black-segmented honey bees by breeding, in favor of a pure yellow strain. It was hoped to breed yellow drones and a yellow queen and get all yellow workers. Specimens of very yellow bees were exhibited.

Dr. Calvert read a note by Prof. Dr. Rudow in Societas Entomologica, Vol. XIII, p. 83, for September 1, 1898, containing a statement of Frau Schreiner, of Wejmar, who declared she had caught a living *Mecistogaster,* a tropical American Odonate, at Driesen on the river Netze, east of Berlin, Germany, in which he questions the possibility of such an occurrence. The speaker said that it had occurred to him that, since we now know that the larva of at least one species of *Mecistogaster* lives in the water enclosed between the bases of Bromeliad leaves (see ENT. NEWS, Vol. xxii, p. 402), it might be possible for such a larva to have been carried in an importation of such plants to Germany and to have transformed there.

Mr. Harbeck spoke of keeping dragonflies alive for a time with a view of preserving their colors.

Dr. Calvert said it was his usual practice to keep them alive in papers for a time, so that they may empty the alimentary canal and thus better preserve their colors.

The Librarian reported the purchase of a number of desiderata in books.

Meeting of October 24, 1912. Dr. P. P. Calvert, President, occupied the chair. Nine persons present.

Mr. Laurent stated that, although *Pyrameis atalanta* was a common butterfly on Five Mile Beach, New Jersey, yet he had never seen them in such numbers as they were on the third of October of the present year. The butterflies gathered together in large numbers on certain bushes, while other bushes nearby were entirely ignored. Hundreds of specimens could have been captured if one was so inclined. As the species is one of our hibernating butterflies, the speaker thought it might be possible that the butterflies gathered together previous to hibernating, as *Danais plexippus* does previous to migrating to the south. Nearly all the specimens were in perfect condition, which indicates a fall brood. Mr. Laurent stated that it was the general opinion that the caterpillars of this butterfly left the food plant and found another place in which to pupate. However, his experience had been different

as he had found a hundred or more of the chrysalids in the bags formed by the caterpillars drawing together the leaves of their food plant.

Mr. G. M. Greene mentioned finding three males and a number of females of *Megarhyssa greenei* Vier. on dead oak trees at Overbrook Seminary, near Philadelphia. They varied much in size.

Dr. Skinner exhibited specimens of *Oncideres putator* and said the species was probably rare in collections. If there is a single brood, this might be accounted for by their late appearance. The specimens were taken by Rehn and Hebard in Sycamore Canon, Baboquivari Mountains, Pima Co., Arizona, October 6-9, 1910; Palo Alto Ranch, Altar Valley, Pima Co., Arizona, October 6-10, 1910; Tucson, Arizona, October 3-4, 1910, and Snyder's Hill, Pima Co., Arizona, October 11, 1910.

Mr. C. J. Cole reported having seen *Pelecinus polyturator* in considerable numbers at Chicago, Illinois. Mr. Greene said they were often plentiful at Castle Rock, Pa.

Dr. Calvert exhibited some Lampyrid larvae which were given to him by one of the investigators of the photometric laboratory of the United Gas Improvement Company, of Philadelphia. He also exhibited a female Odonate, *Libellula exusta deplanata* Rambur, collected by Mr. Philip Laurent at Woodbury, New Jersey, May 14, 1912, apparently the first record of this southern form in New Jersey. Also *Enallagma traviatum*, a female taken at Clementon, New Jersey, and *E. aspersum*, a female from Mt. Airy, Philadelphia, both by Mr. Laurent, both being rare in this part of their habitat.

He also made an address on the Second International Entomological Congress, held at Oxford, England, from August 5 to 10. The interest attached to the place, the old colleges, the University Museum and the excursions were mentioned. The changes in the entomological collection from the time of Westwood to the present day were described. The special character of the collections as illustrating mimicry, protective resemblance, and food and habits of insects rather than systematics, was alluded to.—HENRY SKINNER, *Secretary*.

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(* Indicates *new* generic, specific or subspecific names.)

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EXCHANGES.

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☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued

Lepidoptera for exchange—A number of butterflies from the southwest, such as *A. strigosa, Synchloe california, Melitaea neumoegeni, M. quino, L. mormo, C. australis.* Correspondence desired on special material desired from this section.—J. R. Haskin, 936 Manhattan Place, Los Angeles, Cal.

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The Entomological Exchange—For the exchange of Lepidoptera amongst reliable collectors in all parts of the world. For further information, address with return postage, Rudolf C. B. Bartsch, Secretary, 46 Guernsey St., Roslindale, Boston, Mass.

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Wanted for Cash or good exchange, all American live pupae and cocoons, and 100 or more North American Parnassius in paper not expanded. Give nice exotic Lepidoptera and nice large Coleoptera.—Communicate with Monsieur Frank Sever, 333 E. 49th St., N. Y. City.

Lepidoptera—Specimens of diurnals from this section in exchange for other N. A. species new to my collection.—R. A. Leussler, 1137 S. 31st St., Omaha, Neb.

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